IEEE STANDARDS DEPARTMENT
Comments on RF Environmental Guidelines Amendments
(May 11, 1993)

Interest: Responds to April 21, 1993 FCC letter forwarding the FCC's proposal.

Adoption of 1992 ANSI/IEEE Standard:

- IEEE Standards cannot provide an official IEEE comment on these proceedings. The rationale behind this point of view is based on the fact that all IEEE standards are developed on a voluntary basis, and hence used on a voluntary basis as well. It would, therefore, be inappropriate for the IEEE to lobby for the adoption of its standards by any outside organization. Doing so would be considered in opposition to the very voluntary standards system which the IEEE and its members support (1).

- Although IEEE Standards cannot provide comments on behalf of the IEEE, it will forward this request for comment to the IEEE SCC28 Executive Secretary to distribute to the SCC28 members in order that they may submit comments as individuals interested in FCC proposed standards (1).

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- Not addressed.

Measurement and compliance procedures:

- Not addressed.

Categorical exclusions:

- Not addressed.

Transitional procedures:

- Not addressed.

State preemption:

- Not addressed.

Other issues:

- Not addressed.

IEEE UNITED STATES ACTIVITIES COMMITTEE
ON MAN AND RADIATION
Comments on RF Environmental Guidelines Amendments
(November 9, 1993)

Interest: COMAR has as its primary area of interest the biological effects of non-ionizing electromagnetic radiation, examining and interpreting the biological effects, and presenting its findings in an authoritative manner (1).

Adoption of 1992 ANSI/IEEE Standard:

- COMAR commends the FCC for proposing to update its guidelines with respect to the environmental effects of radiofrequency radiation by incorporating the principles embodied in ANSI/IEEE C95.1-1992. This standard reflects a board consensus of the scientific and engineering communities regarding maximum permissible exposures (MPEs) that will help to assure safe work places and living environments. That consensus is based on a large number of scientific papers published since the ANSI 1982 standard (1).

- It should be recognized that there exists no credible evidence of harm to human beings resulting from exposure at levels specified in ANSI C95.1-1982. The 1992 standard is, to a considerable extent, consistent with the 1982 standard (1).

- COMAR suggests that the Commission processes should be designed to take into account, without the delay of a formal rulemaking, any clarifications of the present standard that may be adopted formally. Such clarifications will not change the basic premises of the standard, but will better reflect the intent of the drafting body (where use of the standard has demonstrated the need for such interpretation) (2).

Induced currents:

- See measurement and compliance procedures.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- The new standard introduces two tiers in which a higher safety factor is applied to the safety limits for exposure in an "uncontrolled environment" of individuals "who have no knowledge or control of their exposure." While some have argued that justification for two tiers is that "certain subgroups of the population are more at risk than others," the new standard rejects this thesis (1).

Measurement and compliance procedures:

- ANSI/IEEE C95.1-1992 is a general exposure standard not specific to any particular industry or use of radiofrequency energy either deliberately radiated or incidental to some process (exclusive of medical applications). Consequently, application of the standard may require specialized interpretations most appropriate for showing compliance in particular situations. A specific instance would be compliance with the induced current restriction (2).

- An example of a needed clarification is the specification that measurements are not to be made closer than 20 cm from any object. In many instances, however, partial body exposure of the user is within 20 cm of the source. Subcommittee IV is attempting to clarify the intent of the standard with respect to such exposure. Another question under consideration is whether all such exposures require determination of specific absorption rates (SAR) in tissue (2).

- Another example of a needed clarification is in the exclusion clause regarding the specification of spatial peak SAR in one gram of tissue. The shape of that one gram of tissue is important and will be better defined in the near future. When such clarifications are adopted, the Commission should be prepared to recognize them and incorporate such clarification into its own process (2).

Categorical exclusions:

- See measurement and compliance procedures.

Transitional procedures:

- Not addressed.

State preemption:

- Not addressed.

Other issues:

- COMAR also recommends the Commission on its ancillary objective to educate the public, e.g., by means of OET Bulletin No. 56. COMAR expresses its willingness to help the Commission in future endeavors toward achieving this objective (2).

INDUSTRIAL HYGIENE INSTITUTE

Comments on RF Environmental Guidelines Amendments
(November 10, 1993)

Interest: Margorie Lundquist, Ph.D., C.I.H., Milwaukee, Wisconsin industrial hygiene consultant familiar with police radar health issues.

Adoption of ANSI/IEEE Standard:

- Both the revised and the former ANSI standard provide virtually the same degree of protection against thermal hazards -- and the same lack of protection against nonthermal hazards. On a cost-benefit basis, the benefit is virtually the same for the two versions of ANSI C95.1; therefore it is reasonable to make the choice between them on the basis of the cost. Since the cost of compliance with the revised version of ANSI C95.1 is higher the standard of choice is the one that the FCC is currently enforcing through its regulations. On this basis, the FCC should not revise its regulations to reflect the revised ANSI standard (2).

- At present there is no basis for assuming that the hazard-versus-intensity curve is monotonically increasing for any nonthermal health hazard. Indeed, there is some experimental evidence to suggest that this function may be roughly Gaussian in shape, with the peak situated three or four orders of magnitude below the limit imposed by the ANSI standard. If this should prove to be correct, it means that the ANSI standard, as it has been promulgated historically, is completely incapable of providing any protection at all against nonthermal health hazards (1).

- What is the evidence that cancer results from long-term exposure to low-intensity nonionizing radiation? There is a great deal of circumstantial evidence, but there is only one set of data providing direct evidence that cancer is produced as a result of such exposure: the epidemic of cancer that is currently raging among law enforcement officers who have used traffic radar guns for a number of years (1).

- The population in greatest need of additional protection may be amateur radio operators. The changes proposed by the FCC, if the revised ANSI standard were to be adopted, will have a considerable -- and expensive -- impact upon this population. However, the protection needed is against cancer -- which the ANSI standard cannot provide (2).

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- Not addressed.

Measurement and compliance procedures:

- Not addressed.

Categorical exclusions:

- Not addressed.

Transitional procedures:

- Not addressed.

State Preemption:

- Not addressed.

Other issues:

- The FCC should assemble a panel of individuals to advise it what action to take, and all further new allocations of the radio-frequency spectrum use should be halted as an emergency action, until the circumstances under which such new use may safely proceed have been determined. Such a moratorium on expanded use of the electromagnetic spectrum would assure that the hazard does not continue to increase while the situation is evaluated.

ALAN S. KAUL
Comments on RF Environmental Guidelines Amendments
(January 10, 1994)

Interest: California licensed radio amateur and "professional broadcaster working in television" comments as a citizen.

Adoption of 1992 ANSI/IEEE Standard:

- Not addressed.

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- Not addressed.

Measurement and compliance procedures:

- Not addressed.

Categorical exclusions:

- Not addressed.

Transitional procedures:

- Not addressed.

State preemption:

- Although "the scientific juries are still undecided on all the environmental effects of RF radiation," it is clear that "the farther away the source of the radiation-the smaller the RF field." Consequently, Mr. Kaul requests a "provision which prohibits local governments from requiring low heights for transmitting antennas" (1).

Other issues:

- Not addressed.

LAND MOBILE COMMUNICATIONS COUNCIL

Comments on RF Environmental Guidelines Amendments
(January 25, 1994)

Interest: Non-profit association of organizations representing users of land mobile radio and providers of land mobile services and equipment.

Adoption of ANSI/IEEE Standard:

- LMCC believes that the ANSI study is the most comprehensive and reliable, and urges the FCC to adopt ANSI's findings (3).

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- LMCC supports distinguishing between controlled and uncontrolled environments, but proposes that the distinction be based on the context of equipment use. In business or commercial settings, where service is available to a limited number of eligible users, "controlled" standards should apply. By contrast, if the general public is likely to use the equipment or if use is effectively available to a substantial portion of the public, stricter "uncontrolled" standards should be used (4).

- A distinction based on context of use and class of user would be consistent with the FCC's approach in the Regulatory Parity proceeding (4-5).

- Under this analysis, the "controlled" environment standard would apply to Part 90 services, and the "uncontrolled" standard would apply to Part 22 and Part 99 services (5). SMR services reclassified as commercial mobile services would likely be subject to the "uncontrolled" environment standard (5 at n. 6).

- Classifications based on FCC rule Parts will provide clear and predictable guidelines (5).

- LMCC urges the FCC to make allowances if users are provided with consistent and comprehensive information in their instruction manuals

concerning radiofrequency radiation, and thus foresees that at some point, Part 22 and Part 99 services may be governed by "controlled" environment standards (6).

Measurement and compliance procedures:

- Formal certifications verifying ANSI compliance are unnecessary and unduly burdensome. However, the FCC should require each licensees to employ appropriate work place standards to ensure compliance with ANSI standards (9).

Categorical exclusions:

- LMCC supports the adoption of the low power exclusion for Part 90 and other similar services, but suggests that the FCC seek guidance to provide for an additional low power exclusion that does not necessitate the physical spacing limitation (7-8).

- LMCC also suggests that the low power exclusion, which as proposed is limited to frequencies of 1.5 GHz and below, be extended to included the PCS services and any new future allocations. LMCC suggests that ANSI use a frequency dependent formula to determine permitted power levels for these new services (8).

- LMCC supports the continued categorical exclusion of equipment regulated under Parts 22, 90, 94, 95, and portions of Parts 21, 74, and 80, and similarly operated equipment (9).

Transitional Procedures:

- Not addressed.

State Preemption:

- Not addressed.

Other Issues:

- Not addressed.

LINEAR CORPORATION

Comments on RF Environmental Guidelines Amendments
(August 13, 1993)

Interest: Linear, an equipment manufacturer, does not declare expressly the basis of its interest.

Adoption of 1992 ANSI/IEEE Standard:

- Linear contends that the adoption of the 1992 ANSI/IEEE standard will place an arbitrary and undue economic burden on the electronics industry and commercial and amateur radio station operators because the testing required to comply with the standard is extremely expensive and because there is no scientific support for the proposition that low-powered, unlicensed radio devices are a threat to human health. The Commission should not adopt the standard (i, 6-8).

- "Most notable" is the proposal to apply new standards "to unlicensed devices, authorized under Part 15." The "testing proposed is extremely expensive," and not justified because "there does not exist a single scientific study which supports the proposition that low-powered, unlicensed radio devices are a threat to persons' health" (1-3).

- Another problem likely to arise from the 1992 ANSI/IEEE standard is that the public will be confused and misled with regard to the hazards connected with the use of electronic devices. If the FCC requires warning labels on electronic equipment when there is no evidence of hazardous electromagnetic radiation, the public will be either unnecessarily alarmed, or, worse yet, unable to distinguish superfluous warnings from those which are important to their safety. If the FCC adopts the new standard, the resulting public misconceptions could be harmful to consumers and damaging to the electronics industry (8).

- Linear objects to the process through which the standard was developed. "Linear has no method of determining whether the persons who comprised the groups that created the standards were forwarding the interests of consumer safety or the interests of their employers." It does not "know whether the efforts of the committees were intended to be adopted into law." If that was their intent, they should have provided "notice and a general opportunity for comment" (10-11).

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- Not addressed.

Measurement and compliance procedures:

- Requiring more processing of Environmental Assessments would tax Commission resources without achieving any safety benefit (4).

Categorical exclusions:

- The likelihood that an unlicensed radio device would fail to meet the Commission's proposed standards is extremely remote. Consequently the "Commission should continue to exclude unlicensed device manufacturers from the requirement and extreme cost of demonstrating a known result" (4).

- Elimination of the low-power exclusion for devices operated within 2.5 cm of the body could require "testing of all electronic devices operated by hand." That would require "enormous amounts of financial, administrative and human resources" with "no logical basis." In fact "recent studies performed by the Cellular Radio industry indicate that there is no hazard arising out of operation of hand-held transceivers" (12-14).

- The present exclusion for hand held radio receivers and transmitters operated at 7 watts or less is appropriate. The standard's testing and potential warning label requirements are costly and unnecessary (14).

- Many "low-power, intermittent or normally inaccessible RF transmitters and facilities, including commercial and amateur radio installations" are currently exempted but would not be excluded under the standard. They would need "field intensity surveys" and "retests of field intensity and new warning labels" any "time an antenna or commercial operator changes antenna, feedline, tower height or transceivers." The field intensity surveys will be expensive and "homeowners and other property owners located" nearby "are likely to be unnecessarily alarmed by the required radiation surveys" (15-16).

- Mobile radio stations presently are excluded. With "a 3 to 6 dB gain roof mounted antenna, these stations' ERP will exceed the standard," perhaps requiring a "label warning the public that their equipment emits hazardous radiation" or even cessation of transmission. There is "no evidence showing that mobile installations

cause health threats to the public," so the "standard will yield burdensome and absurd results" (16-17).

Transitional procedures:

- Not addressed.

State preemption:

- Not addressed.

Other issues:

- By not making the full standard readily available, such as from the government printing office at a reasonable charge, the Commission has denied an opportunity to comment and thereby violated the Administrative Procedure Act. Availability from IEEE for $54.00 for non-members or inspection at the FCC is not adequate (9-10).

MATSUSHITA COMMUNICATION INDUSTRIAL CORPORATION OF AMERICA

Comments on RF Environmental Guidelines Amendments
(November 10, 1993)

Interest: MCC/Panasonic is a "manufacturer of cellular mobile telephones, digital business telephone systems, pagers and car audio."

Adoption of 1992 ANSI/IEEE Standard:

- The clarifications and interpretations proposed by MCC/Panasonic are consistent with the stated purpose of the standard. The standard was issued as a set of recommendations to the industry. As a recommendation, it didn't matter if one industry took a slightly different interpretation than another. What mattered was that the industry, as a whole, followed the general spirit of the recommendations. With its adoption, the character of the standard changes. It is no longer a list of recommendations. An innocent mistake or misinterpretation by a manufacturer can cause significant costs and delays. Some forethought and interpretations of the standard should help the industry and the FCC meet the objectives of the standard, "to prevent harmful effects in human beings exposed to electromagnetic fields in the frequency range from 3 kHz to 300 GHz" (14).

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- Not addressed.

Measurement and compliance procedures:

- SAR measurements should be made using a distance to the surface that is based on the "typical manner of usage" (i.e., in accordance with directions) not bizarre "what if" scenarios (8-9).

- MCC/Panasonic, stressing that the engineer cannot wait until a design is finished to see if it satisfies a standard, notes that an engineer relies on analytical tools (mathematical analysis) and laboratory techniques to predict the final result. Thus,

"the FCC should approve some analytical techniques to verify and later to certify the compliance of a new radio or cellular telephone design with the standard." Post-completion testing "may be too expensive and impractical." Authoritative technical publications show that analytical techniques for SAR accurately predict test results (10-12).

- Testing should not be required for devices whose maximum radiating power is very low compared to that allowed by the standard, e.g., where the standard allows .7 watts, testing should not be required for a maximum radiating power of .07 watts (12).

- MCC/Panasonic proposes a formula that should be allowed within 2.5 cm of the body as an alternative to testing: "Power, from a point source, obeys an inverse square law. However, for an infinite line source this relationship becomes simply an inverse (linear) law. Thus, at very close distances, an antenna can be treated as a line source. Thus, the 1.4 (450/f) watts for a 2.5 cm source distance from the body become 0.7 (450/f) watts for a source distance of 1.25 cm from the body" (12-13).

- MCC/Panasonic requests that, for devices like cellular telephones, manufacturers be allowed to show compliance on the basis of "average transmitted power" rather than maximum rated power (13).

Categorical exclusions:

- MCC/Panasonic requests "clarifications" and proposes "interpretations" to eliminate "ambiguities." Its proposals reflect the "premise" that "devices or parts of a device that radiate power at much lower levels" (e.g., a factor of 10) than the "Standard's controlled and uncontrolled environment, should not require certification" (1).

- MCC/Panasonic proposes clarification of the definition of "radiating structure" so more devices will qualify for the low power exclusion, namely, defining "radiating structure" as "any part of the device that radiates energy at more than ten percent of the power allowed under the Standard's low-power device exclusion for controlled and uncontrolled environments" (5-7).

- MCC/Panasonic proposes an "interpretation" for measuring SAR averaged over a cubic-shaped volume of tissue: "Assume a density of human tissue to be about one gram per cubic centimeter. Then, the SAR required under the exclusion would be the SAR averaged over a one centimeter cube. On thick surfaces, one would average the SAR over a one centimeter thickness. On thin tissue, such as the ear lobe, the cubic-volume rule means that the SAR is averaged over a one centimeter depth. This one centimeter includes ear lobe tissue and air space" (8).

Transitional procedures:

- Not addressed.

State preemption:

- Not addressed.

Other issues:

- Not addressed.

MAXWELL SAFETY PRODUCTS LTD.
Comments on RF Environmental Guidelines Amendments
(January 5, 1994, December 2, 1993, November 18, 1993
November 4, 1993 and July 27, 1993)

Interest: New York-based marketer of Naptex RF protective clothing seeks FCC recognition of a role for such clothing as an "additional mitigating measure" protecting workers and responds to related comments of others (see Narda, Doty-Moore).

Adoption of 1992 ANSI/IEEE Standard:

- Not addressed.

Induced currents:

- See other issues.

Contact currents:

- See other issues.

Controlled v. Uncontrolled environment:

- Not addressed.

Measurement and compliance procedures:

- Not addressed.

Categorical exclusions:

- Not addressed.

Transitional procedures:

- Not addressed.

State preemption:

- Not addressed.

Other issues:

- Maxwell forwards a report supporting the "performance of Naptex RF Protective Clothing in the frequency range of 2 MHz through 400 MHz," as protection against induced currents. Report is authored by Dr. Richard Olsen. Another attached report shows protection at higher frequencies (Nov. 4, 1).

- Maxwell responds to two points made in the Narda comments. First, it criticizes "Loral's statement that the Magnetic (H) Field is as much as 60 dB higher than the energy content of the Electric (F) Field" as applying only at AM frequencies and criticizes the value of the "NardAlert," which detects only H-fields. Second, Maxwell defends its Naptex Protective Clothing for "reducing the SAR" on the ground that "it is the Electric (E) Field which is the primary causative factor of SAR" and because the fact that Naptex does not attenuate H-fields does not mean it fails to protect (Dec. 2, 1-2).

- Furthering its argument in favor of the "protective suit made from Naptex," Maxwell submits 1992 "German Telekom" tests results showing that, although "resonances" are found inside a suit in a test using an empty suit, when tested with a human body inside, "all the resonances that were apparent in an empty suit disappear" (Jan. 5, 1).

McCAW CELLULAR COMMUNICATIONS, INC.

Comments on RF Environmental Guidelines Amendments
(January 25, 1994)

Interest: Cellular telecommunications service provider.

Adoption of ANSI/IEEE Standard:

- The FCC properly proposes to rely upon the 1992 ANSI/IEEE Safety standard as the basis for evaluating RF exposure (2-6).

- The 1992 ANSI/IEEE standard appears to be the most comprehensive and scientific consensus standard available. The process ensured representation of a broad range of scientific disciplines, and the standard incorporates all relevant scientific findings on RF bioeffects, addresses all environmentally significant aspects of RF exposure, incorporates substantial safety factors, and is consistent with other standard setting efforts (2-5).

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- Not addressed.

Measurement and compliance procedures:

- Not addressed.

Categorical exclusions:

- Part 21 and Part 22 base station transmitter facilities should continue to be categorically excluded from routine environmental processing (7-13).

- Cellular and paging base stations are highly unlikely to exceed relevant safety standards, because they are low power, operate intermittently, use low-exposure antenna designs, are inaccessible, and building-attenuation limits exposure (7-9).

- Field test data confirm that cellular base stations comply with all exposure limits and safety standards (9-12).

- Microwave point-to-point transmitters are highly unlikely to exceed the limitations specified in the 1992 ANSI/IEEE protection criteria (12-13).

Transitional Procedures:

- Application of any new compliance rules for Part 21 and Part 22 base stations should be prospective only (13-15).

State Preemption:

- The FCC should initiate a proceeding to preempt state and local oversight over RF exposure from cellular facilities (17-30).

- McCaw describes numerous instances where state or local regulation has delayed or prevented siting of cellular facilities (17-22).

- Such state and local oversight threatens the public's interest in a high quality, low cost, ubiquitous and spectrum-efficient cellular communications network (22-27).

- Preemption can be implemented in a limited fashion that minimizes the FCC's administrative burdens and places effective limits on the extent of permissible state and local RF exposure oversight (29-30).

Other issues:

- The evidence shows that cellular portables are unlikely to exceed the 1992 ANSI/IEEE safety standards. This includes Dr. Gandhi's recent test results showing SARs for 10 cellular hand sets. Although these are an important indicator of safety, cellular manufacturers are in a better position to meet the relevant exposure criteria (15-16).

MOTOROLA

Comments on RF Environmental Guidelines Amendment
(January 25, 1994)

Interest: Equipment manufacturer.

Adoption of 1992 ANSI/IEEE Standard:

- The standard adopted in 1992 by ANSI is sound and scientifically based, and is an appropriate choice by the FCC for the basis of its rules. While the FCC is the appropriate agency to promulgate rules relative to radiofrequency equipment, it should consult other agencies with complementary expertise to assist in its determination of final rules. (1-2)

- See other issues.

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- The exposure limits applicable to the uncontrolled environment should be applied to users of cellular telephones as well as to any members of the general public who may be near radio transmitters. (4-8)

- Other similar services such as future PCS services should also be included in the uncontrolled category. (8)

- Those users included within the FCC Part 90 Private Land Mobile Radio Services, with the exception of certain SMR users, should be governed by the limits applicable to the controlled environment. (4-9)

- Certain operations authorized under Parts 94, 95, and appropriate portions of Parts 21, 74, and 80 should also be included in the controlled environment category. (8)

Measurement and compliance procedures:

- The ANSI low-power exclusion provisions should be adopted as a basis for establishing adherence to the standard. (10)

- The SAR measurement is a useful way to establish compliance with the ANSI standard. (10-11)

- Adherence based on SAR measurement should be reported to the FCC as part of the equipment approval process by requiring an affirmative indication of compliance on the application form. (24)

- Believes the FCC's estimated separation distances from a land mobile antenna installation to assure compliance with the 1992 ANSI standard are overstated and provides its own analysis. (25-26, Appendices A, B, and C).

Categorical exclusions:

- Concurs with TIA that the effective date of the FCC's Order must be based upon the timeframe for developing standards for measurement procedures and test site facilities. (23)

- The FCC should adopt the same categorical exclusions for Parts 22, 90, 94 and others that currently exist and any future services, such as PCS, should also be categorically excluded from routine environmental consideration with regard to RF exposure. (14-20)

Transitional Procedures:

- It is unnecessary for the FCC to take any specific action with regard to existing land mobile installations used in Parts 22, 90, 94 and other related Parts. (22-23)

- Recommends the ANSI frequency limit be extended to encompass future situations, such as PCS operation at 2.2 GHz. Extension up to 5 GHz may be justified. (11-12)

- The 2.5 cm limitation may not be necessary for some lower power services and the FCC is urged to support and facilitate the necessary effort to develop and adopt this additional exclusionary provision as it will be beneficial to PCS and other low power new services. (12)

State preemption:

- Not addressed.

Other issues:

- The NCRP standard specifies limits of exposure for amplitude modulated radiofrequency carriers that are credible and the FCC should continue to monitor the research relevant to this form of modulation and take appropriate action in the future if warranted. (21-22)

NARDA MICROWAVE CORPORATION

Comments on RF Environmental Guidelines Amendments
(November 11, 1993)

Interest: Narda (Loral) is "the leading designer and manufacturer of instrumentation used to measure and/or detect radiofrequency radiation" (1).

Adoption of 1992 ANSI/IEEE Standard:

- Not addressed.

Induced currents:

- See measure and compliance procedures.

Contact currents:

- See measure and compliance procedures.

Controlled v. Uncontrolled environment:

- Not addressed.

Measurement and compliance procedures:

- Narda has recently developed a contact current meter (Model 8870) as well as an induced current meter (Model 8850). It is Narda's experience that although a reasonable relationship exists between electric field and magnetic field levels and induced current levels, no such predictable relationship exists between E and H field levels and contact current levels (1).

- Recent testing for the U.S. Navy found "contact currents varied by greater than 8 dB for a constant field strength at the re-radiating structure. Much of the variation is related to the position of the subject relative to the position of the primary and secondary radiators" (1).

Categorical exclusions:

- Not addressed.